AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently amended) A multilayered air-fuel ratio sensor having a plurality of stacked layers comprising:

a plurality of substrate layers comprising at least one solid electrolytic substrate layer and at least one insulating substrate layer; and

a boundary layer interposed immediately between said solid electrolytic substrate layer and said insulating substrate layer without any other intervening layer;

wherein each of said solid electrolytic substrate layer, said insulating substrate layer, and said boundary layer is obtained by sintering original particles of a source material so as to change the original particles to sintered particles, and an average size of the sintered particles of said boundary layer ~~has an average sintered particle size that~~ is adjusted to be larger than ~~that~~ an average size of the sintered particles of each of said solid electrolytic substrate layer and ~~that is larger than that of~~ said insulating substrate layer. ~~layer, and~~

~~said boundary layer serves as a partition positioned between a gas chamber and the outside of said sensor.~~

2. (previously presented) The multilayered air-fuel ratio sensor according to claim 1, wherein said boundary layer has a porosity larger than that of said substrate layers.

Claim 3. (canceled)

4. (previously presented) The multilayered air-fuel ratio sensor according to claim 1, wherein said boundary layer comprises a component selected from the group consisting of alumina, spinel, and steatite.

Claim 5. (canceled)

6. (previously presented) The multilayered air-fuel ratio sensor according to claim 1, wherein said boundary layer has a thickness in a range of 10 to 100 μm.

7. (previously presented) The multilayered air-fuel ratio sensor according to claim 1, wherein said substrate layers comprise a plurality of solid electrolytic substrate layers, and further comprising a plurality of additional boundary layers, respectively interposed immediately between two consecutive solid electrolytic substrate layers without any other intervening layer.

Claims 8-9. (canceled)

10. (previously presented) The multilayered air-fuel ratio sensor according to claim 1, wherein the composition of said boundary layer is different from the composition of said solid electrolytic substrate layer.

11. (previously presented) The multilayered air-fuel ratio sensor according to claim 10, wherein the composition of said boundary layer is different from the composition of said insulating substrate layer.

Claims 12-17. (canceled)

18. (currently amended) A multilayered air-fuel ratio sensor having a plurality of stacked layers comprising:

a plurality of substrate layers comprising at least one solid electrolytic substrate layer and at least one insulating substrate layer; and

a boundary layer interposed immediately between said solid electrolytic substrate layer and said insulating substrate layer without any other intervening layer;

wherein each of said solid electrolyte substrate layer, said insulating substrate layer, and said boundary layer is obtained by sintering original particles of a source material so as to change the original particles to sintered particles, and an average size of the sintered particles of said boundary layer ~~has an average sintered particle size that~~ is adjusted to be larger than ~~that~~ an average size of the sintered particles of each of said solid electrolytic substrate layer and ~~that is larger than that of~~ said insulating substrate layer and wherein the composition of said boundary layer is different from the composition of said solid electrolytic substrate layer. ~~layer, and~~

~~said boundary layer serves as a partition positioned between a gas chamber and the outside of said sensor.~~

19. (previously presented) The multilayered air-fuel ratio sensor according to claim 18, wherein said boundary layer has a porosity that is larger than that of said substrate layers.

20. (previously presented) The multilayered air-fuel ratio sensor according to claim 18, wherein said boundary layer comprises a component selected from the group consisting of alumina, spinel, and steatite.

21. (previously presented) The multilayered air-fuel ratio sensor according to claim 18, wherein said boundary layer has a thickness that is in the range of 10 to 100μm.

22. (previously presented) The multilayered air-fuel ratio sensor according to claim 18, wherein said substrate layers comprise a plurality of solid electrolytic

substrate layers, and further comprising a plurality of additional boundary layers, respectively interposed immediately between two consecutive solid electrolytic substrate layers without any other intervening layer.

Claim 23. (canceled)

24. (previously presented) The multilayered air-fuel ratio sensor according to claim 4, wherein said boundary layer is made primarily from α-alumina with an average sintering particle diameter of 3 to 4 μm.

25. (previously presented) The multilayered air-fuel ratio sensor according to claim 4, wherein said at least one solid electrolytic substrate layer is made of yttria partially-stabilized zirconia with an average sintered particle diameter of 2 to 3 μm.

26. (previously presented) The multilayered air-fuel ratio sensor according to claim 4, wherein said insulating substrate layer is formed from a component selected from the group consisting of alumina, spinel and steatite.

27. (previously presented) The multilayered air-fuel ratio sensor according to claim 20, wherein said boundary layer is made primarily from α-alumina with an average sintered particle diameter of 3 to 4 μm.

28. (previously presented) The multilayered air-fuel ratio sensor according to claim 20, wherein said at least one solid electrolytic substrate layer is made of yttria partially-stabilized zirconia with an average sintered particle diameter of 2 to 3 μm.

29. (previously presented) The multilayered air-fuel ratio sensor according to claim 20, wherein said insulating substrate layer is formed from a component selected from the group consisting of alumina, spinel and steatite.

30. (previously presented) The multilayered air-fuel ratio sensor according to claim 1, wherein said insulating substrate layer is made of alumina.

31. (previously presented) The multilayered air-fuel ratio sensor according to claim 10, wherein said insulating substrate layer is made of alumina.

32. (previously presented) The multilayered air-fuel ratio sensor according to claim 18, wherein said insulating substrate layer is made of alumina.

33. (currently amended) A multilayered air-fuel ratio sensor having a plurality of stacked layers comprising:

a plurality of substrate layers comprising one solid electrolytic substrate layer serving as a ceiling or a bottom of a sample gas chamber into which a sample gas is introduced and another solid electrolytic substrate layer defining side walls of said sample gas chamber; and

a boundary layer interposed immediately between said one solid electrolytic substrate layer and said another solid electrolytic substrate layer without any other intervening layer;

wherein each of said one solid electrolytic substrate layer, said another solid electrolytic substrate layer,. and said boundary layer is obtained by sintering original particles of a source material so as to change the original particles to sintered particles, and an average size of the sintered particles of said boundary layer ~~has an average sintered particle size that~~ is adjusted to be larger than ~~that~~ an average size of the sintered particles of each of said solid electrolytic substrate layers. ~~layers, and~~

~~said boundary layer serves as a partition positioned between a gas chamber and the outside of said sensor.~~

34. (previously presented) The multilayered air-fuel ratio sensor in accordance with claim 33, wherein said boundary layer is made of α-alumina with an average sintered particle size of 3 to 4 μm.

35. (previously presented) The multilayered air-fuel ratio sensor in accordance with claim 33, wherein

said solid electrolytic substrate layers are made of partially-stabilized zirconia with an average sintered particle size of 2 to 3 μm, and

said boundary layer is made of α-alumina with an average sintered particle size of 3 to 4 μm.

36. (previously presented) The multilayered air-fuel ratio sensor in accordance with claim 35, wherein

an alumina green sheet for said boundary layer has an average particle diameter smaller than that of a zirconic green sheet for said solid electrolytic substrate layers.

37. (previously presented) The multilayered air-fuel ratio sensor in accordance with claim 33, wherein

said solid electrolytic substrate layers are made of partially-stabilized zirconia and said boundary layer is made of alumina, and

a thermal expansion coefficient of said partially-stabilized zirconia is substantially the same as that of said alumina.

38. (previously presented) The multilayered air-fuel ratio sensor according to claim 33, wherein said boundary layer has a thickness in a range of 10 to 100 μm.

39. (currently amended) A multilayered air-fuel ratio sensor having a plurality of stacked layers comprising:

a plurality of substrate layers comprising one solid electrolytic substrate layer serving as a ceiling or a bottom of a sample gas chamber into which a sample gas is introduced and another solid electrolytic substrate layer defining side walls of said sample gas chamber; and

a boundary layer interposed immediately between said one solid electrolytic substrate layer and said another solid electrolytic substrate layer without any other intervening layer;

wherein each of said one solid electrolytic substrate layer, said another solid electrolytic substrate layer, and said boundary layer is obtained by sintering original particles of a source material so as to change the original particles to sintered particles, and an average size of the sintered particles of said boundary layer ~~has an average sintered particle size that~~ is adjusted to be larger than ~~that~~ an average particle size of the sintered particles of said solid electrolytic substrate layers, and wherein the composition of said boundary layer is different from the composition of each of said solid electrolytic substrate layers. ~~layers, and~~

~~said boundary layer serves as a partition positioned between said sample gas chamber and the outside of said sensor.~~

40. (previously presented) The multilayered air-fuel ratio sensor in accordance with claim 39, wherein said boundary layer is made of α-alumina with an average sintered particle size of 3 to 4 μm.

41. (previously presented) The multilayered air-fuel ratio sensor in accordance with claim 39, wherein

said solid electrolytic substrate layers are made of partially-stabilized zirconia with an average sintered particle size of 2 to 3 μm, and

said boundary layer is made of α-alumina with an average sintered particle size of 3 to 4 μm.

42. (previously presented) The multilayered air-fuel ratio sensor in accordance with claim 41, wherein

an alumina green sheet for said boundary layer has an average particle diameter smaller than that of a zirconic green sheet for said solid electrolytic substrate layers.

43. (previously presented) The multilayered air-fuel ratio sensor in accordance with claim 39, wherein

said solid electrolytic substrate layers are made of partially-stabilized zirconia and said boundary layer is made of alumina, and

a thermal expansion coefficient of said partially-stabilized zirconia is substantially the same as that of said alumina.

44. (previously presented) The multilayered air-fuel ratio sensor according to claim 39, wherein said boundary layer has a thickness in a range of 10 to 100 μm.

45. (new) The multilayered air-fuel ratio sensor according to claim 1, wherein an average size of the original particles of said boundary layer is smaller than an average size of the original particles of each of said substrate layers.

46. (new) The multilayered air-fuel ratio sensor according to claim 18, wherein an average size of the original particles of said boundary layer is smaller than an average size of the original particles of each of said substrate layers.

47. (new) The multilayered air-fuel ratio sensor according to claim 33, wherein an average size of the original particles of said boundary layer is smaller than an average size of the original particles of each of said substrate layers.

48. (new) The multilayered air-fuel ratio sensor according to claim 39, wherein an average size of the original particles of said boundary layer is smaller than an average size of the original particles of each of said substrate layers.